also reviewing the differential response of lymphocytes from various sources. Chapters 9 and 10 deal with the kinetics of lymphocyte response to a variety of stimulants and the metabolic activity of the cells (RNA and protein synthesis) after stimulation.

Chapters 11 and 12 deal with one of the most perplexing areas in this field. Phytohemagglutinin, the first stimulant described, has yielded only minimally to attempts at complete separation of its various properties: erythroagglutinating, leukoagglutinating, and mitogenic. Other agents have been less recalcitrant. Despite this, little has emerged in terms of the mechanism of action of the agents and response in the lymphocytes. Ling does review the available knowledge, delving into several of the theories which have been advanced by various authors about the receptor sites on the lymphocytes and the subsequent activation of the cells. This is an area which the author has covered well, both in the presentation of the facts and in discussion.

The last chapter, entitled "Clinical Aspects of Lymphocyte Transformation," is devoted to a discussion of lymphocyte response in various diseases.

There can be no question that the author has made a contribution to this field by writing the book. As he predicted, it would now be virtually impossible for any one person to cover this entire field. While many of the facts listed in the book may no longer be totally correct, the volume still serves as a thorough reference compilation and historical introduction. Since this will be its major value, Ling has perhaps very wisely avoided a critical review of the ideas expressed, but has left it to the reader to go to the quoted literature and more recent works for his own critical evaluation, which can then serve as a springboard for his own activity.

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The Rise and Fall of T. D. Lysenko. By ZHORES A. MEDVEDEV. Translated from the Russian by I. MICHAEL LERNER. New York: Columbia University Press, 1969. Pp. xii + 284. $10.00.

This extraordinary book relates one of the most bizarre stories in the annals of modern science—the suppression and eventual rehabilitation in Soviet Russia of the science of genetics. From about 1935 to 1964, biological research and teaching in the Soviet Union were dominated by T. D. Lysenko, a shrewd political charlatan posing as a scientific innovator and as the discoverer of new principles in agricultural practice.

According to Lysenko, heredity is a general internal property of living matter and as such does not need a separate genetic system localized in the chromosomes and transmissible from generation to generation. Lysenko, and his closest associate and theorist, I. I. Prezent, advanced a theory of heredity without any supporting facts and with complete disregard of the overwhelming factual evidence for Mendelian genetics. Extension of this theory of heredity to various areas of theoretical and applied biology sterilized much biological research and crippled the agriculture of Soviet Russia for nearly 30 years.

How was it possible for one obvious quack to control many administrative posts and to dominate biological and agricultural research in a large country which is at the forefront in many other fields of science? The frontispiece in the book reproduces a photograph of a sculpture representing Stalin and Lysenko, seated facing each other, Lysenko presumably receiving Stalin's instructions. This bronze sculpture, which stood in a public square in the town of Ostrog from 1950 to 1961, indicates that Lysenko enjoyed to a high degree intimacy with, and support from, the higher authorities in the Russian government. Stalin's exclama-

tion, "Bravo, comrade Lysenko, bravo," after a speech by Lysenko in 1935 launched the latter in his meteoric career. Lysenko's power over the biological scientific establishment reached its climax at the August 1948 session of the Lenin All-Union Academy of Agricultural Sciences. Lysenko's speech at this session was personally edited by Stalin. In the aftermath of this speech, hundreds of scientists were arrested or dismissed.

Khrushchev also gave full personal support to Lysenko and reacted angrily to expressions of doubt by scientists or by political officials concerning Lysenko's activities. On October 14, 1964, the presidium of the Central Executive Committee (CEC) relieved Khrushchev of the posts of prime minister and first secretary. On the previous day, the noted geneticist Rapoport had been approached by the CEC with a strange assignment: to prepare for the public press within 24 hours a full-page article on the achievements of genetics.

Khrushchev's downfall ended the official support of Lysenkoism in Russia. Lysenko and his followers have lost many of their administrative posts. Since the fall of 1964, many scientists and educators in Russia have been engaged in restoring genetics research and in reorganizing the teaching of biology from the elementary schools to the universities.

Human history is always dramatic and often contains elements of tragedy. Tragedy and drama are closely intertwined with the events narrated by Medvedev. Many Russian scientists lost their lives in the struggle for scientific truth and human dignity against Lysenkoism. As Lysenko is the antihero, the hero of Medvedev's story is N. I. Vavilov. Vavilov, perhaps the world's greatest plant breeder of his time, was the bull's eye of Lysenko's attacks in the 1930's. In August 1940, Vavilov was arrested, and he was condemned to death on July 9, 1941. He died while in prison at the beginning of 1943. Medvedev's tales of heroism comprise those of many other scientists besides biologists. The candidacy of Nuzhdin—a Lysenkoist with full support from Khrushchev—for membership in the Academy of Sciences was rejected by the academy in June 1964 by a vote of 126 against and 22 or 24 in favor, in spite of the favored recommendation of the Lysenko-controlled biology section. Sakharov, a well-known Russian physicist, ended his speech against the candidate with this indictment: "As for myself, I call on all those present to vote so that the only 'ayes' will be by those who, together with Nuzhdin, together with Lysenko, bear the responsibility for the infamous, painful pages in the development of Soviet science, which fortunately are now coming to an end. [Applause.]"

The author of this book is one of the heroes in the struggle for truth and scientific freedom. In June 1963, at a plenary session of the CEC, Medvedev was attacked for having circulated an earlier draft of this book. The book, in fact, has not been authorized for publication in Russia. Through unofficial channels a microfilm of the typescript came into possession of I. M. Lerner, who has made the translation and adapted the text for Western readers.

The Rise and Fall of T. D. Lysenko is not only history but also an indictment against any interference from governments or political ideologies with science. As the translator says in the foreword, this book "has meaning not only as a history, but also as a warning of what could happen in any country that relaxes or suspends its vigilance over concern for scientific freedom, for whatever reason."

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Elementary Probability for the Biological Sciences. By JAMES E. MOSIMANN. New York: Appleton-Century-Crofts, 1968. Pp. 255. $3.95 (paper).

The author states in the preface that "this book is an introduction to the mathematical theory of probability, designed for the beginning college student who is oriented towards the